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Documents.

DRY DOCKS.

Report of the Secretary of the Navy, in relation to the construction of a Dry Dock.

NAVY DEPARTMENT, 3d January, 1825.

To the Senate of the United States.

I have the honour to present the following answer to a resolution of the 25th May last, "that the Secretary of the Navy be directed to report to the Senate, at an early period of the ensuing session of Congress, such information as may be in the possession of the Department, or he may think proper to communicate, relative to the expediency of constructing, at one of the navy yards of the United States, a Dry Dock, of sufficient capacity for receiving, examining, and repairing ships of the line; and to report on the usefulness, economy, and necessity of a dry dock—the best location therefor, and the probable expense of constructing such dock, of the size aforesaid, in a solid and durable manner, and with the needful appendages for an advantageous use of the same."

This resolution calls for information on three points—

1. The expediency, usefulness, economy, and necessity of a dry dock, of sufficient capacity for receiving, examining, and repairing ships of the line.
2. The best location for a dry dock.
3. The probable expense of constructing one, of the size mentioned, in a solid and durable manner, with the needful appendages for an advantageous use of it.

Upon the first point there are no views to be presented. The arguments by which the propriety of building docks for the examination and repairs of large vessels is proved, have been frequently offered to the consideration of Congress, from the first establishment of the Navy Department to the present time. The extracts accompanying this report, will exhibit the uniform current of opinion upon the question, with all those who have devoted the most attention to it, and I respectfully refer to the report of the Board of Navy Commissioners, hereto annexed, and marked A, as shewing that the views of those best able to judge, remain unchanged.

The Navy Department was created in April, 1798. In December of that year, the Secretary expressed his strong conviction of the necessity of docks, (see paper marked B,) and every succeeding administration, either by the sanction of laws or by official recommendation, has confirmed this opinion. On the 25th February, 1799, a law was passed, authorizing the erection of two docks for the convenience of repairing public ships and vessels, and appropriating \$50,000 for the purpose—3 vol. 130. On the 15th December, 1802, the then President Jefferson recommended to Congress the erection of docks for this and other purposes—(see paper marked C.) On the 3d March, 1813, \$100,000 were appropriated for the purpose of establishing a dock yard for repairing vessels of war—4 vol. 425. Neither of the laws mentioned were executed; the probable reason, in both instances, being the total inadequacy of the appropriation to accomplish the object. And, it has happened, that, notwithstanding the concurrence of professional, legislative, and executive opinion, we still remain without this indispensable part of an efficient naval establishment. The evil resulting from the want of it is always proportioned to the number and size of the vessels to be repaired; and however it might heretofore be disregarded, the time seems

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now to have arrived, when attention to it is called for by irresistible considerations, and when neglect must induce an extravagant waste of public money. It is a remarkable circumstance, that, holding the rank which we do among the naval powers, we should not have one dock for the repairs of the vessels in which we take so much pride, and that we are, in this respect, behind every other nation, however inferior in naval strength.

There are now in our navy, either built or upon the stocks, twelve ships of the line and thirteen frigates, besides smaller vessels. All of these require frequent repairs and still more frequent examinations, because defects, which are neglected, increase with great rapidity. When much below the water line, they can be examined and repaired only in one of two modes,—by heaving them down or placing them in a dry dock. The former operation is greatly objectionable, for many reasons. It occasions loss of time and labour. It is necessary entirely to dismantle the vessel, and after the repairs are completed, refit it; in which operations, from three weeks to a month must always be consumed. Additional time and labour are necessary to heave her down, first upon the one side and then upon the other.

It is a very expensive operation. The value of the time and labour consumed in dismantling, heaving down, and refitting, is very great; and the inconvenience of the position in which the workmen are obliged to do the repairs, renders the operation slow, and of course expensive. It is insufficient thoroughly to accomplish the object: The repairs cannot be strongly and well executed, especially in the bottom, and of course will not be permanent; it injures the vessel.—The power necessarily applied on the principle of the lever, to turn it upon its side, strains it and renders it less firm and able to bear pressure, either in actions or storms, and decay ensues more rapidly. This injury is often unknown until it is too late to apply the remedy. The risk is also very great, as an injury to the purchases, by which it is hove down, might, when repairing the bottom, occasion the sinking and entire loss of the ship. And in removing the planks, beams, &c. the frames are not sufficiently bound together, and being unsupportable by the water at the ends, it loses its shape and is greatly damaged.

All these inconveniences are avoided by docks. The vessel may be placed in them in a few hours without entirely dismantling, and retained there without risk. The workmen can labour, on each side, at the same time, and in convenient positions. The work is thoroughly done, because there is no obstacle in the way. The ship unstrained, uninjured, and left in its perfect shape.

The difference of the two modes, therefore in expense, in time, and in the effect upon the vessel, can admit of no dispute as to the expediency, usefulness, and economy of adopting the latter. It costs much less, requires much less time, and leaves the vessel in a much more permanent and lasting condition.

It is, therefore, confidently believed that it is "expedient, useful, economical, and necessary," even in time of peace, to have docks, by which our vessels, costing us so much, may be more cheaply repaired, and longer preserved; but in a period of war when time is often victory, they will be doubly necessary, as well as doubly economical. And it is to be recollected, that they require so long a time to complete them, that if

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we would have them in war, we must build them in peace.

2d. *Their location.* Various and conflicting opinions, on this point, have, at different periods, been entertained and expressed by intelligent and scientific men, all of them demanding respect and consideration; but it is believed that this contradiction has arisen, rather from a comparison of advantages among good locations, than a denial of fitness in any of the most prominent ones. Each person who has made a selection, has been led to his choice by some one or more favourite quality, or circumstance, which has created the preference in his mind; but, had he been deprived of the one he thought best, he would have found it easy to admit the fitness and excellence of some other. The difficulty has not been to find a suitable place for a Dry Dock, but to select the best, among several, all of which are good. Many useful opinions have been given, and reports made on this subject, and I respectfully refer, among others, to that of the Commissioners of the Navy, and to the Message of the President of the United States, on the 6th February, 1818, in answer to a resolution of the Senate, and transmitting copies of the reports, in relation to the surveys and examinations made by naval officers, in co-operation with officers of the corps of Engineers. Other surveys and examinations have been taken, of a more minute character, which are in possession of the War and Navy Departments; but it is believed that their publication is not necessary to a decision of this question, and would be rather profitable to our enemies, should we have any, than to ourselves.

The opinion, expressed by the Commissioners of the Navy, of the necessity of having two docks, one in the eastern section of the Union, and the other in the waters of the Chesapeake, is believed to be perfectly sound, and the conviction is respectfully, but earnestly expressed, that this is a moment in which the best interests of the public demand that two should be commenced. They will be found indispensable in war with a powerful enemy upon our coast, and should be so located as to be most readily approached in the time of necessity.

With this view their location is recommended at Charlestown, Massachusetts, and Goepert, Virginia. Neither of them possesses some of the qualities, for which the right bank of the Hudson, above the Highlands, was formerly recommended, for a dock yard, "to be a nucleus, around which a great naval establishment might be formed," particularly its security from the possibility of approach by a powerful naval enemy. (See paper marked D.) But it is believed that the time may be now fairly anticipated, when arguments, founded on our acknowledged inferiority on our own shores, will be felt, less forcibly, than at former periods; and, whatever may be the eventual decision, in locating and forming a great naval depot for the Union; the places mentioned are well suited to the object now contemplated—the examination and repairs of our vessels; and will be necessary in every future state of the naval establishment, whether fortunate or adverse, peaceable or warlike; and no selection of a naval depot can be made which will render them useless.

At Charlestown there are already a valuable navy yard and improvements, to which a dock may, advantageously, be added, without the purchase of any more ground, or other expense, save that of the work itself. That place also possesses most of the properties essential to such an

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establishment, whether designed, eventually, as an extensive depot, or merely as a repairing and refitting station; such as depth of water, and accessibility at all times, and seasons; security from injury by winds, tides, and ice; dense surrounding population; commercial capital; numerous mechanics, and great facilities in obtaining provisions, seamen, and timber, and difficulty of blockade. There cannot well be error in placing a dock where these advantages exist.

At Gosport there is also a valuable yard, with improvements, but there is not within its limits so good a position for a dock as upon the adjoining land, which may be bought for a small sum, and add much to the convenience and utility of the establishment already there.

The Chesapeake, and its waters, form a first object in every plan relating to the national defence, and somewhere upon them must be placed an important portion of our naval means. Whether our principal depot ought to be there, the resolution does not direct us to enquire. But let that question be decided as it may, Gosport must be retained as a repairing and refitting station, to which resort can be had in cases of need.—Lying behind the strong defences at Old Point Comfort and the Rip Raps, it can never be unimportant as a naval position. It has a numerous surrounding population; deep water; susceptibility of defence; accessibility at all times; freedom from frost; great facilities in obtaining supplies of materials, and stands at one of the most important and connecting points, in that great line of internal intercourse and navigation, to which the public attention has, at all times, been so strongly directed.

It is then considered expedient to build a Dry Dock at Charlestown, and another at Gosport.—But if the considerations which lead to this opinion have been incorrectly valued by me; and Congress determine that one dock only should be built, I am of opinion, that that one should be placed at Charlestown, as possessing some advantages over Gosport, as to ground, tide, workmen and supplies.

3. In answer to the third inquiry, the probable expense of constructing a dock, I refer to paper marked E, and the report of the commissioners marked A, as the best guides which can be furnished. This is a point on which minute precision and accuracy is not pretended. However perfect we may be in theory, we have little practical experience in forming such estimates, and are therefore liable to error. Since the passage of the resolution, the best information has been sought and obtained within the reach of the department. Paper marked E, estimates the expense at \$280,000, and is prepared by I. Baldwin, who has had an opportunity of inspecting some of the most important docks in Europe, and possesses probably as large a share of science, skill, and experience, in works of a similar character, as any of our fellow-citizens. His paper recommends itself to our confidence by the clearness, simplicity, and candour of its statements. The remarks of the commissioners, however, justify a belief that the estimate of Mr. Baldwin may be found less than a substantial and permanent construction of the dock may require. And as it is always best before we commence any work, to "count the cost," the sum of \$350,000 estimated by the commissioners, should be taken as the amount which will probably be drawn from the Treasury, by building a dry dock, for our largest ships at Charlestown.

There are no particular surveys, examinations or estimates, by which to measure the cost of a dock of like dimensions at Gosport; but there is no reason why it should cost less. The expense

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of the two may therefore be estimated \$700,000. The whole of this sum need not be appropriated at one time. The work would probably not be completed in less than three years, and if \$250,000 were appropriated for the purchase of the land, materials, &c. it would be sufficient for the present year, or \$150,000, if one only be ordered to be built. I am, very respectfully, your obedient servant, SAML. L. SOUTHARD.

A.

NAVY COMMISSIONER'S OFFICE,
25th November, 1824.

SIR: The Navy Commissioners have had the honour of receiving your letter of the 2d inst. with a copy of a resolution, passed by the Senate of the United States on the 25th May last, calling upon the Secretary of the Navy "to report to the Senate, at an early period of the ensuing session of Congress, such information as may be in the possession of the Department, or he may think proper to communicate, relative to the expediency of constructing, at one of the Navy Yards of the United States, a Dry Dock, of sufficient capacity for receiving, examining, and repairing ships of the line; and to report on the usefulness, economy, and necessity of a Dry Dock; the best location therefor, and the probable expense of constructing such Dock, of the size aforesaid, in a solid and durable manner, and with the needful appendages for an advantageous use of the same," and they now respectfully submit the following Report:

The expediency of constructing Dry Docks or the use of the Navy, will not, it is believed, be doubted, when some of the inconveniences resulting from the present want of them are made known. Whenever repairs, or an examination, of that part of vessels which is much below their water line, becomes necessary, we are now compelled to divest them entirely of their armament and equipment, and subject them to the process of heaving out, operations attended with considerable risk, great expense, and loss of time, and unavoidable injury to the vessels. These evils increase in proportion to the increased size of the vessels upon which the operations are performed, while all of them would be much diminished, or entirely obviated, by Dry Docks calculated for their reception.

As regards the probable cost of a Dock of the proper dimensions, the Commissioners have not been able to obtain any information more satisfactory than the estimates accompanying the plan furnished by Mr. L. Baldwin, and which you were pleased to refer to them for examination. These estimates, from the short time in which they were necessarily made, do not enter sufficiently into detail to enable the Commissioners to test their correctness by analysis or comparison; but, from the known intelligence and experience of Mr. Baldwin, it is believed they may be safely relied upon so far as they extend.

From the report made of the nature of the soil, upon the site proposed at Charlestown, Massachusetts, the Commissioners are of opinion, that it would be unsafe and improper to hazard a work of such importance and expense upon the natural foundation, and that it ought to be rendered perfectly secure by piles, which would probably add from fifteen to twenty thousand dollars to the estimated expense. Mr. Baldwin has also stated that his estimate is confined exclusively to the Dock itself, and does not embrace wharves and other objects that may be necessary for the most advantageous use of it. Provision ought, undoubtedly, to be made for these objects, as they can be most economically constructed at the same time with the Dock, and in connection with it. Their cost must vary materially, according to

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the particular location of the Dock, and cannot, therefore, at present, be estimated with any minute accuracy; but it is believed, that at least fifty thousand dollars will be requisite to construct them of the proper extent, and with the necessary stability. These sums, added to the estimate of Mr. Baldwin, swell the estimate to 350,000 dollars; but, large as it appears, the Commissioners have no doubt that it will be an eventual saving, of both money and time, to the public, to expend it for the object proposed.

Referring only to a period of peace, during which the movements of our naval force are subject to the will of the Department, a single Dock, as appears to be contemplated by the resolution of the Senate, might be made to answer the wants of our present force; but, under other circumstances, when the disposition of our vessels may be controlled by a variety of events, it will be found essentially necessary to have at least two of our Yards provided with this accommodation; one upon the waters of the Chesapeake, another upon our eastern coast. The Commissioners would, therefore, respectfully suggest the propriety of endeavouring to procure the necessary authority from Congress, to commence two Docks, at such places as, in the opinion of the Department, may be most conducive to the public interests, after more particular information shall have been obtained upon the subject. If authority can be obtained for one only, the Commissioners feel incompetent to determine upon the best location for it, until they shall have obtained more precise and detailed information of the advantages and disadvantages which the different yards possess.

I have the honour to be, with great respect, sir, your most obedient servant,

JOHN RODGERS.

To the Hon. SAMUEL L. SOUTHARD,
Secretary of the Navy.

Extract of a Report from W. Jones to the Honourable President of the Senate, dated
NAVY DEPARTMENT, November 15th, 1814.

"Dockyards, foundries, smitheries, and armories, in safe and eligible situations, are indispensable appendages of so important and growing an establishment. These always collect the best workmen; and, as private interest cannot interfere with the execution, the materials and workmanship are better, and the work is performed with more certainty and regularity, than by contract with private individuals; whose works, in some cases, may be so remote from the seat of demand, that the transportation may cost more than the article."

B.

Extract of a Report from the Honourable Secretary of the Navy, dated December, 1798, to the House of Representatives.

"Docks will be highly necessary in repairing our ships, to avoid the tedious, expensive, and sometimes dangerous operation of heaving down. They can undoubtedly be made in the Eastern States, where the tides rise very considerably; probably in New-Hampshire, Massachusetts, or Rhode-Island. Whether they can be made with equal advantage, or to answer valuable purposes, to the southward of Rhode Island, or New-York, I cannot form any accurate judgment from any information I possess; though it would, unquestionably, be a great public advantage to have a Dock near the entrance into the Chesapeake Bay, and another still further south, if circumstances will admit."

C.

Extract from President Jefferson's Message, dated 15th December, 1802.

"Presuming it will be deemed expedient to

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expended annually a convenient sum towards providing the naval defence which our situation may require, I cannot but recommend that the first appropriations for that purpose may go to the saving what we already possess. No care, no attentions, can preserve vessels from rapid decay, which lie in water, and exposed to the sun. These decays require great and constant repairs, and will consume, if continued, a great portion of the money destined to naval purposes. To avoid this waste of our resources, it is proposed to add to our navy yard here, a dock, within which our present vessels may be laid up dry, and under cover from the sun. Under these circumstances, experience proves that works of wood will remain scarcely at all affected by time. The great abundance of running water which this situation possesses, at heights far above the level of the tide, if employed as is practised for lock navigation, furnishes the means for raising and laying up our vessels on a dry and sheltered bed. And should the measure be found useful here, similar depositories for laying up, as well as for building and repairing vessels, may hereafter be undertaken at other navy yards, offering the same means."

D.

Extract from a Report of B. W. Crowninshield, relative to the establishment of a Dock Yard.

DECEMBER 7TH, 1815.

"The Act of March 3d, 1813, appropriating one hundred thousand dollars, for the purpose of establishing a dock yard for repairing vessels of war, &c. could not be carried into effect during the late war, from the multiplicity of imperious duties which devolved upon the Secretary of the Navy in the active operations of the general service.

This subject, however, received all the attention which the Secretary could bestow upon it; surveys of particular sites, and the opinions of scientific men were collected, preparatory to decision, which was suspended by the events of the year 1814; and no further measures were taken until after the peace. During the summer past, inquiries and surveys have been made, the result of which will be laid early before Congress. The importance of this appendage to the naval establishment, the necessary arrangements connected with it, and the amount necessary to carry the system into complete effect, require a more detailed statement and estimate than can be embraced in the present report, without anticipating the result of a survey in the southern section of the United States, which is not yet completed.

I cannot omit this occasion of repeating the opinion of the absolute necessity and urgency of having docks constructed as soon as possible for the repairs of our vessels of war."

Extract of a letter from W. Jones to the Hon. William Linn, Chairman of the Naval Committee, dated
NAVY DEPARTMENT, March 9, 1814.

"No farther steps have been taken in relation to the dock-yard, than general inquiry and proper deliberation, in order to determine upon the best site in a central situation.

The result has decided in favour of the right bank of the Hudson, above the Highlands. The motives to this decision were, from considering the contemplated dock-yard as the nucleus around which a great naval establishment may be formed, comprising wet and dry docks, forges, foundries, boring, rolling, saw and block mills, blast and smelting furnaces, an armory, hydraulic engines, rope works, manufactories of sail duck, and work shops of all kinds, which will require a copious head of water, readily commanded in

this vicinity. Here, also, will be the main arsenal and depot of timber and materials of all kinds, and the principal dock yard for constructing and repairing ships of war.

Such an establishment in any of our seaports, accessible to ships of the line, would form so great a temptation to a powerful enemy, as to render destruction certain, unless protected by forts and garrisons of the most formidable and expensive nature.

The natural defences at the pass of the Highlands are such as to remove all doubt on this subject, and supersede the necessity of a large protecting force. The Hudson is a deep, bold, noble stream, of easy and safe navigation. The surrounding country produces abundance of iron, and large quantities of hemp, and the banks of the Hudson furnish a variety of timber, fit for naval purposes.

The communication with the northern and western Lakes is more direct and favourable to the distribution of naval and military stores than any other situation that can be selected.

The only objection of importance that I have heard suggested, is, that the Hudson, at this point, is closed by the ice a fortnight sooner, and opens a fortnight later, than at New-York; but this objection is greatly overbalanced by the extraordinary advantages of the situation.

In order to select the most suitable situation, a careful examination and survey, under the direction of some of our most experienced officers, aided by a skilful engineer, appears to be indispensable; an opportunity for which has been prevented by the active operations of the war, and consequent occupation of the officers best qualified for this service."

Extract of a letter from Commodore Charles Stewart to the Hon. P. Hamilton, dated United States' Frigate Constellation, November 12, 1812.

Question 5. Would not the erection of docks for the repairs of our vessels, produce a great saving in expense, labour, and risk; and would not docks greatly expedite the refitting of our ships?

Answer. A dry dock, agreeably to a plan I furnished the Department some time since, to be freed from water by pumps or drains, will be indispensable for the repair of ships of war, and will be the least expensive way of repairing the bottoms of our ships, and will expedite the outfits, in point of time, one to ten.

Argument. A ship of war, wanting repairs done to her bottom, or coppering, must be turned down, one side at a time, to undergo that repair; therefore, to prepare a ship for that process, requires that all her upper masts should be taken down, and all her guns, stores, water casks, ballast, ammunition, &c. should be taken out, which leads to great loss, waste, and labour; and the time occupied in the process will be from two to three weeks, and as much more time will be required to re-rig, re-equip, and replace her guns, stores, and other materials. The preparation to dock a ship of war can be done in twelve hours. All that is necessary to be done is to take out the guns, and pump the water out of the water casks; and, when in dock, the repairs of her bottom can progress on both sides at the same time. Should a ship of war require a thorough repair throughout, it never can be effectually done but in a dock; for instance, in repairing ships of war in the water, they are liable to have the fine form of their bottom spoiled, by hogging, spreading, or warping, which will materially affect their sailing. Ships wanting thorough repairs, require all the plank stripped off inside and outside, their beams, knees, and clamps, taken out; (these are all they have to bind their frames to

gether, and thereby preserve their shape; but, when stripped of them to make room for the new, they are liable to hog from the greatest weight and body of timber being in the fore and after end, at which places there is no pressure upwards caused by the water, as those ends are sharp; the two extremes of the ship are liable to sink in the water, while the body, or middle of the ship, rises with the upward pressure of water.

The next consideration, in repairing the bottoms in the water, though not of such vital importance, is not unworthy of serious attention: the bolting in the bottom ought to be driven from the outside; but, when repaired afloat, they are under the necessity of driving them from the inside; hence the bottom will not be so strong, nor so well secured."

We agree with Captain Stewart in the within statements, in all its parts. ISAAC HULL.
C. MORRIS.

E.

Boston, November 6th, 1824.

HON. SAMUEL L. SCUTHARD,
Secretary of the Navy.

DEAR SIR: Pursuant to the request you made, when I had the pleasure of meeting you here in September, I have the honour of communicating the result of my examination, and inquiries relative to a Dry Dock at the Navy Yard in Charlestown. It has been impossible to close the investigation earlier, by the unexpected difficulties which attended the soundings and borings, and the time required to complete the drawings. I have been wholly occupied on this subject since I began, and although you will not receive the communication as soon as you expected, I hope the delay will not have been attended with any inconvenience.

I have prepared three drawings to accompany this, which, with the following remarks and estimates, will furnish all the information I have been able to procure, in the short time afforded me for this purpose. The drawing No. 1, shows the ground plan of part of the navy yard with the ship-house, wharf, and other works, near the proposed site of the dock. I laid off three lines, forty feet apart, and parallel with the N. E. line of the ship-house, the nearest at a distance of 170 feet. On these lines, beginning behind the battery, were laid off cross lines, at equal distances of 50 feet each, extending to the lower corner of the wharf, and, at the intersection of these lines, which were contemplated to be within the space, to be occupied by the dock, most of the borings and soundings were made. The points of intersection on each of these principal lines are marked A, B, C, and to K 2; 1, 2, 3, &c. to 13; and L, M, N, &c. to X. On the profiles are noted the strata and kinds of earth reached by the auger; but, as the strata of gravel, sand, clay, &c. were too irregular to allow of their being marked by boundary lines, with distinctness on the profiles, I have written the names of the substances pierced or reached by the soundings, and the depths of each is marked in feet. The red lines on the plan and profiles, represent the proposed position of the dock, by which, and a reference to the corresponding letters and numbers on each, the site will be understood. The position and general plan of a coffer dam, are also marked on this drawing.

The drawing No. 2, shows a plan of the proposed dock, with a longitudinal section through the axis.

No. 3 contains cross sections of the dock and entrance, shewing the manner of forming and laying the stone work on the front of the masonry, and the form of the steps or altars of the dock

The plan and elevation of the gates, with a scale of the day-tides for October, at the navy yard, are also shown on this drawing. The lines representing the outside of the timber frame of a ship are those of the ship, No. 2, now building at Charlestown.

POSITION.

The situation I have indicated, is the one pointed out by Commodore Bainbridge, as probably the best calculated for building and using a dry dock, and that which I understood had been thought most eligible by yourself and the Commissioners of the Navy Board, and, I have no doubt that a single dock may be built here, with as much advantage as at any other point in the yard, on account of the depth of water, where the entrance will be formed. Should the Government determine to build one, it may be advisable to examine other parts of the yard, for the purpose of selecting the most advantageous ground, and should the proposed location be adopted, its exact position may be varied from the one I have given, as circumstances shall require. I have not had sufficient time to examine the yard in other places.

EXCAVATION.

The soil indicated by boring and digging is mainly gravel, sand and clay. Some rocks were reached by the auger and stopped it. They are probably insulated, and will be no injury to the work, as they show the firm nature of the earth, on which it is advisable to found all such buildings. Sand is found at six feet depth in a trial pit, dug near the battery, as represented on No. 1. Gravel was dug through six feet, and the auger descended four feet further through sand, which fell in and choked it so as to stop all further progress. The two old wells in the yard, shown on the plan, are thirteen feet deep, three or four feet towards the bottom being sand, and all above gravel. Water stands in the east well at about 5 1-2 feet depth, and in the west well, 3 1-2 feet. The bottom of the wells is 21 feet above the floor of the Dock, or about 27 above the bottom of the necessary excavation. From the result of the other trials, there is no doubt, this stratum of sand descends to low water mark, or a little lower, and would be passed in digging for the foundation, in the place proposed, and a firm solid bed of gravel or clay be reached for founding the work.

FOUNDATION.

When the excavation is sunk to near the proper depth, complete and satisfactory soundings may be had, so as to determine whether piling shall be necessary. I have not represented any timber pilings for the foundation, on the drawings, as the nature of the soil, as far as it could be ascertained, did not seem to require it. Neither have I included it in the estimates, presuming the firmness of the ground would be sufficient, without the necessity of resorting to piling. But it may probably be found necessary, or advisable, to pile under the gates, and under the wings, as in all ground not extremely firm and homogeneous, piling is the best means of laying a solid foundation, and ought not to be omitted in cases that are doubtful. An allowance for this expense may be made in the estimates. On the drawing No. 2, will be seen the section the ends of the sleepers and floor timbers and the planking. I propose to lay down a course of sleepers, 13 inches square across the dock, and at 3 feet distance from centre to centre. Under and between these the space to be filled even with the upper surface, with dry stones or rubble work, rammed closely, and over the timbers a floor of 3 inch plank, spiked to the sleepers. Upon this is to

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be another course of floor timbers, 16 by 13 inches, laid directly over the former, to be well bolted or tre-nailed through the planking into the sleepers. The spaces between the upper timbers to be filled in with masonry, and the whole covered with a second floor of 3 inch plank, on which will immediately rest the stone work of the dock. It is necessary to give to the floor all the strength and solidity possible, both to resist the downward pressure of a ship when docked, and also to resist the upward hydraulic pressure, when water stands below and is acted upon by the height of the tide on the outside. The force of this pressure upward, it is difficult to estimate; but its greatest influence should be guarded against. I have, therefore, represented in the drawings a course of 5 inch sheet piling, running round the whole area of the foundation, to prevent as far as possible, the passage of water under the floor. This becomes particularly necessary under the face of the wing walls, and under the gates. By this means the water must ascend perpendicularly through the ground under the foundation. Should this accumulation of water be great, the hydraulic pressure upward may be neutralised by vent pipes or plugs through the floor opening into the interior of the dock; and this expedient, I should adopt, as it would be attended with no inconvenience. This force, I cannot suppose sufficient to lift the floor with such a mass of masonry upon it, if the floor is skilfully and firmly laid; but, it might be such, as to spring it considerably, and thereby loosen and destroy the compactness of the stone bottom of the dock, if the floor is not rendered very stiff.

COFFER DAM.

On the drawing, No. 1, are lines shewing the position, length, and breadth, of the Coffier Dam. The wide part is in the deep water, and will have a pressure of 25 or 28 feet at high water. It is 450 feet long, and 20 wide, to be formed of square timber piles. On the outside of each row of piles are to be three belts or ribbons, one at the top, one at the lowest line, at which it can be placed at low water of spring tides, and the third, at an intermediate line, between the other two. The top of the dam to be held together by timber ties or caps, locked on at every 5 feet, and an iron tie bolt of 1 1-2 inch bar, going through the dam, and each set of belts below the cap having a head at one end, and a key or screw and nut at the other, to keep the piles from spreading. The dam to be 20 feet wide, including the piles, which will be one foot thick. The narrow part of the dam running parallel with the dock, and at one hundred feet from it, terminates at the upland, near the battery, and is 350 feet long. Two rows of piles 6 feet apart, to be driven to form the outside and inside of the dam. On the inner side of each row, are to be fixed 4 belts or ribbons, of 10 inches thick, to support the sheet piling 3 inches in thickness. Cap timbers to be locked on to the top of each pair of piles, with a tie bolt of iron running through the dam at the third ribbon from the top, under each cap. The whole of each part of the dam to be filled up with earth, rammed to prevent the percolation of water. Over the whole, stringers and planking to form an accommodation bridge during the execution of the work. The thick part of the dam will be terminated at the corner of the earth wharfing, near the east angle of the ship house. The narrow part may be so placed as to remain and make part of the filling necessary on the N. E. side of the dock, and thus the expense of its removal avoided. But the best and most economical arrangement of this, and many other parts of the work, can be made after it has been determined to build the dock, and with reference to ulterior labours.

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DRAINING.

As most of the borings were made under tide water, from 3 to 20 or 30 feet deep, no satisfactory experiment could be made, shewing in what quantity the water will penetrate within the enclosure of the dam. The two wells marked on the plan, one about 150, and the other 200 feet from the enclosure, have both an abundance of water, and the copious supply furnished to them for ordinary purposes, through the stratum of sand, would, without doubt, be continued to the excavation. At the trial pit, dug below the battery, where the ground was overflowed two or three feet at every tide, the water percolated through the clay gravel composing the upper stratum 6 feet thick, so that while the men worked, after the tide retired and left the surrounding shore bare, they were impeded in digging, and were often obliged to stop and bail out the water. On boring in the sand below, the water continued to come in more copiously, and probably much rose from the sand stratum which might have been fresh. That which came in through the gravel was salt, though not so strong as the tide water. At the lower end of the dock, where the distance is small from the sand, &c. outside the dam to the excavation within, it may naturally be expected that much water will find an entrance, unless the piling of the dam should be made to reach a firm, thick bed of clay, which seems to underlay all this section of shore. Upon examining the profiles at the place where the dam is to be erected, the clay appears within a few feet of the surface of the ground, at two profiles, and at the other, the north-east profile, mud and sand are found twelve feet deep, but the piling in the last place would be easily effected through this stratum. From these circumstances, it will be necessary to provide sufficient means for pumping or otherwise keeping the basin of the dock dry. A steam engine of forty horse power to work chain pumps, &c. should be provided, and other pumps, to be worked occasionally, by men or horses, should also be in readiness. I have therefore included in the estimate, a steam engine, with pumps, &c. with the expense of supporting it for three years. The engine may usefully be retained in the navy yard for sawing, &c. when the docks are completed, and as it will be necessary to pump out the water when a ship is to be docked, it can at all other times be employed for other work.

PLAN OF THE DOCK.

The drawing No. 2, with the sections on No. 3, exhibit the form and dimensions of the dock sufficiently clear, I presume, to render a particular description unnecessary. The entrance is 60 feet wide, and will admit the great ship, building at Philadelphia, giving a water way on each side of about nine inches. Between the face line of the wing walls and the recesses for the gates, the entrance is formed by side walls and bottom, in curved lines, with radii of curvature marked on the sections on No. 3. The form is similar for that part of the entrance between the gates and dock. This mode of building is much stronger, and will require less masonry than perpendicular walls, or those made with the usual talus. The floor of the gates must be preserved horizontal, to allow them to open freely. At the entrance before the gates are two rabbets or grooves, for placing a floating gate or temporary dam to guard the main gates, or serve to leave them dry for repairs, &c. On the plan and sections at A A, B B, are shown the wells for capstans for opening and shutting the gates, by means of chains hooked to the rings seen on the elevations in No. 3. The length of the bottom of the dock from the foot, on a line with the first stairs to the centre

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of the eddy bottom betw feet, and the coping, is 8 four feet w half the de the top of outside the docking gangway up dock, all th on it.

At the do for pumps feet wide is municating for water to a slope of circular be of the face en, and th inverted a effectually pressure.

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of the curved head, is 201 feet. The breadth of bottom between the first steps on each side is 30 feet, and the interior breadth at top, between the coping, is 86. The broad platform or gangway, four feet wide, as exhibited on the plan, is at about half the depth of the dock, being 16 feet below the top of the coping. It is so placed as to be outside the scaffolding and shores required for docking or repairing ships. To preserve this gangway uninterrupted round the interior of the dock, all the stairs and slips are made to land upon it.

At the dotted circles GG, on the plan, are wells for pumps to drain the dock, and a gutter two feet wide is seen at C, and the dotted lines communicating with the wells. To give a descent for water to the gutter, the bottom of the dock has a slope of 18 inches from the centre of the semi-circular head. On the sections No. 3, the form of the face stones to the entrance walls are given, and the steps of the dock have the form of inverted arch stones or voussoirs, to resist more effectually the rising of the floor by hydraulic pressure.

GATES.

From the position chosen for the dock, it is advisable to give ample means of protection against the agitation and violence of storms. I have provided for this purpose, by making the rabbets or grooves, as shewn on the plan, but instead of a floating gate in ordinary cases, to make use of turning gates, constructed in the usual form. At the new docks at Cherbourg and at those at Rochfort in France, floating gates are used. They are seen also at Chatham in England. At Cherbourg, the entrance to the dock is from a large receiving basin, where no violence from the sea can be felt, and the two latter are on the rivers Cherone and Medway, where no great agitation from tide or waves takes place. The superior new docks at Sheerness have turning gates made of cast iron, except the planking; and afford an opening of 56 feet. But the entrance is from a wet dock, having another pair of gates, opening to the Medway. Although floating gates are used in many places, turning gates are most generally adopted.

To give additional strength to these gates, which afford an opening four or five feet wider than any I have seen in Europe, braces may easily be put in when they are closed after docking a ship. To guard them on the outside from injury, a fender or floating gate may be fitted to the rabbets. In works of such magnitude and importance, provision should be made to prevent, even for a short time, any obstruction in the use of the dock, and therefore this double mode of forming gates seems important.

The wooden turning gates represented on drawing No. 3, are 21 inches thick, having a curvature of 18 inches. The planking to be three inches, and interrupted at one of the intermediate ribs, so that the part above ordinary low water, which is most exposed to injury or decay, may be taken off and renewed whenever required. This mode of fitting the planks is seen on the elevation, but should have been represented on the next rib above. All the gudgeons, caps, and metal fastenings, below low water mark, should be made of composition metal—all above may be iron, and I have so estimated them. The roller, and circular cast iron rail to support it, while the gate is turning, are shewn on the drawing.

Cast iron capstans are to be fitted into the wells shewn at A-A, BB, on the plan, and at AA in the sections, drawing No. 3. Upon the top of the gates may be constructed a light foot bridge, as represented on No. 3, with wooden or iron rails.

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I have shewn but one wicket to each leaf of the great gate, which is to be drawn by a screw, as seen on the elevation, and the screw head in the foot-bridge. But there may be two, should it be thought expedient.

ACCOMMODATION WHARVES.

In no part of the expense of erecting extensive works, is so little attention paid to economy as in providing accommodations for facilitating the delivery, preparing and moving the heavy and cumbersome materials to be used. The loss of time and labour for want of convenient arrangement, in these respects, is very great; and as it is generally imperceptible and incapable of being estimated on a large scale, it is too often overlooked by builders. To provide for these advantages, I propose covering the coffer dam with a bridge, and it makes part of the estimate under this head. In addition to this, a temporary wharf should be built on the outside, and connected with the coffer dam. Perhaps a permanent wharf may be expedient on the east side—the entrance of the dock, opposite the present ship wharf, seen in drawing No. 3. The new wharf would afterwards be joined and made level with the filling or banking on the east side of the dock.

SHOPS, SHEDS, MACHINERY, &c.

Although the nature of the contemplated work does not require much work within shops, still a blacksmith's and a carpenter's shop, lime sheds, &c. will be wanted, and they should be erected as near the works as possible. They will, of course, be of a temporary kind, and are calculated accordingly. The expenditure for machinery, such as cranes, trucks, wagons, with other mechanical apparatus, and the scaffolds, troughs, and facilities for draining, cannot be precisely calculated. Under this item, I have endeavoured to fix a sum nearly correct.

CEMENT.

I have added Roman cement to the estimate, because there is, perhaps, no substance so perfect in its kind, or so certain and durable. Other cements are employed, but this is preferable to any I have seen used in this country. It would be worth the experiment, should the dock be undertaken, to try a new hydraulic cement, lately invented by Mr. Casius, of Utrecht. The great double locks, &c. on the North Holland Canal, between the Helder and Amsterdam, have been built about four years, and the bricks are laid in this cement. It appeared almost as hard as the bricks themselves when I saw them last year. The patentee gave me some specimens, and informed me that it was made cheaper than any hitherto in use. It is made from the peculiar kind of earth or clay taken up from under the water of the Y, at Amsterdam. It is made into balls, burned in a furnace like lime, and then pulverized.

Removing Coffer Dam and Deepening the Channel to the Dock.

From the position of the dock it will be perceived, by inspecting the profiles, that an additional depth, under and outside the Coffer Dam, must be obtained by dredging, &c. so as to admit vessels to enter. The entrance being 60 feet wide, only about 70 or 80 feet of the dam need be removed; or perhaps the removal may extend the length of the wing walls. The north-east side of the present wharf may be extended to the line of the entrance, and the angle between the wing wall of the dock and the wharf, occupied by a new part, so as to leave the whole surface or terra-plein, between the dock and the ship house, level, extending to the lower end of

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the wharf. On the opposite, or north east side of the entrance, a permanent wharf, like the one already built, may be erected on a line with the entrance, covering the angle of the dam, and connected and made level with the filling on the north side of the dock. Some considerable extension of wharf seems indispensable for a convenient use of the dock and for other purposes connected with the navy yard. Instead of confining the distance between these wharves to the breadth of the entrance, viz: 60 feet, where one large vessel might lie, it may be made 100 or 120 feet wide, so that two vessels may lie there, one to each wharf. But I will not presume to recommend, at present, any particular plan for this purpose. I make the suggestion only to shew that little expense need be incurred in removing the Coffer Dam. As the filling and banking, level with the coping of the dock, will in great part be effected by the excavation of the dock, at least so far as will be required for its use, I do not include any estimate for additional filling; that may be done to an extent suited to the ulterior improvements in the yard.

ESTIMATE OF EXPENSE.

1. Coffer Dam covered for an accommodation bridge	\$18,200 00
2. Excavation of basin for dock, &c.	12,648 00
3. Foundation floor	25,000 00
4. One pair of turning gates, with capstans and chains, foot bridge, &c.	9,000 00
5. Masonry of dock	79,159 00
6. Ditto of entrance	34,000 00
7. Stone stairs and slips	2,031 00
8. Roman cement	8,000 00
9. Accommodation wharves, &c.	3,000 00
10. Shops, sheds, and machinery	3,500 00
11. Steam engine of forty horse power, and support three years, with chain pumps, &c. for draining	20,000 00
12. Removing Coffer Dam, and deepening the entrance	6,000 00
13. Engineer, superintendents, overseers, &c.	15,000 00
Contingencies,	44,462 00
Total Expense of Dock	\$280,000 00

In the above estimates and observations, together with the drawings which accompany them, I have endeavoured to place before you all the information I could communicate, in the short time which circumstances would allow me. I have no doubt you will find them defective or unsatisfactory in many respects; but I hope they will afford you some aid in coming to the desired result, which is an estimate of the expense of a dry dock, capable of receiving our largest ships. For this purpose, I have confined my examination and estimates to the simple expense of the dock, without taking into view any extensive plan for improving the Navy Yard at Charlestown. To have gone further would have required much time; and would seem to have exceeded your directions. Should Government order a work of this kind, it will then be advisable to repeat and extend the examination, so as to place the dock in an advantageous situation, relative to future and more extensive improvements in the yard.

I have assumed, as a safe height for the coping of the dock, and quay walls against the highest tides, a level line from the cap sill of the wharf towards the corner below the ship house; which level meets the sill of the house, at the north corner, at the ground. The depth of the dock is taken from this level, and is 31 feet 3 inches, to the surface of the floor, at the lowest part. The

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floor rises 1 foot 6 inches, to the centre of the semicircular head, which affords a slope for water to descend to the draining wells, and accords nearly with the usual slope of the keel of a ship, as she generally floats. To dock a ship, an ordinary tide, at high water, will afford ample room to block her to any convenient height. To give, by inspection, a convenient mode of estimating this circumstance, I have added, near the gates on drawing 3, a scale of the day tides, made from a register, kept at the yard, for the month of October. By this scale, it will be seen that high water, on the 2d, was lower than any other similar tide, during the month, except the 31st, which was two inches lower still. I assumed the tide of the 2d, for fixing the depth of the dock. It rose to within 5.90 feet of the top of the dock. Deducting this from 31.25 feet, leaves, even for that unfavourable tide, 25.35 feet. Deducting, also, the height of the blocking, represented on the plan as 2.33 feet high, gives 23.03 feet draught for a ship to enter the dock. Most of the other tides were a foot higher, and those of the spring, about the 22d, two feet higher than on the 2d.

The ship, No. 2, building at Charlestown, is taken as the scale, to graduate the interior dimensions of the dock, and a transverse section, amid ship, is seen at the sections on drawing 3. This ship will draw, when light, with her armament, &c. out, ready for docking, about 19 feet; and that at Philadelphia, in a similar state, not more than 20 feet. Should, therefore, the space represented in the drawings, not appear sufficiently large for convenient working, under and round the ship, the blocking, for such a tide as October 2d, may be raised three or four feet, for the former ship, and two or three for the latter; which will, evidently, enlarge the space to a commodious extent for repairs. At other tides, still more room is attainable.

Upon the section on drawing 2, are given the lines at the bow and stern of the Charlestown ship, with the fore and after perpendiculars dotted in red, and the distance, 196 feet 3 inches, marked between them. The after perpendicular is represented no further advanced in the dock, than is necessary for docking, so as to show the whole distance, 23 feet, from the fore perpendicular to the head of the dock; by which, ample length is given for docking the Philadelphia ship.

Upon the whole, I can perceive no difficulty in constructing a dock, in the place proposed. The ground is not so favourable as I had anticipated, from what had been reported; but it is as good as, perhaps, any other spot in the yard; and the difficulties no greater, perhaps much less, than will be met with in all similar situations, near the borders of deep tide water. The opening immediately into water, deep enough for our largest ships to float at all tides, is a fortunate circumstance, and probably, not to be found any where else. The plan I submit to your consideration, has been made in haste, without having had time to make it wholly satisfactory and complete in all its parts. Many details and minute circumstances have been omitted; and, without doubt, upon further reflection, I should find several improvements and alterations desirable.

I am indebted to Commodore Bainbridge for the facilities he has furnished in all my examinations in the yard, and for the plans he has submitted to my inspection. I have, also, the pleasure of acknowledging the valuable advice and information I have received from him, in our frequent conversations upon the subject.

I have the honour to be, with great respect and esteem, your obedient servant,

L. BALDWIN.

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CANAL REPORT.

Report of the Select Committee to which was referred, on the 3d ultimo, a memorial of the General Assembly of the state of Illinois, upon the subject of a canal communication between the Illinois River and Lake Michigan, accompanied with a bill to aid the state of Illinois in the accomplishment of the same.

The Select Committee to which was referred the memorial of the General Assembly of the state of Illinois, praying for aid from the United States in opening a canal to connect the waters of the Illinois River and Lake Michigan, respectfully submit the following Report:

The memorial represents what the committee find to be true, that, in 1820, a law was passed by Congress, authorizing the said state to open a canal through the public lands to effect this communication, which is required to be done within a given period. It further represents that the General Assembly has already proceeded so far as to appoint commissioners to explore the route and prepare the necessary surveys and estimates preparatory to its execution. It further represents that the state is unable, out of its own resources, to defray the expense of the undertaking; and, therefore, prays Congress to make to the state a grant of public land, or such other assistance as may be thought most proper, to enable the state to proceed with the work.

In examining this subject, the attention of the committee has been drawn to several points which seem naturally to bear upon it; and first, as to the practicability of making the proposed connection of those waters. On this branch of their inquiries the committee can see no room to doubt. Although the report of the state commissioners and engineers had not been made to the General Assembly at the time of adopting the memorial that has been referred to the committee, the Legislature of that state entertained no doubt on that point. Such, indeed, is the concurrence of scientific observation and actual experience in relation to that fact, that, in order to establish it, the report was not necessary. The experience to which the committee refers, is that of many years, and which is matter of historical notoriety. It is that of repeated passages having been made, by uninterrupted navigation, from the river into the lake. With respect to the scientific observations that have been made, the committee refer to the report of Major Long to the Secretary of War, in 1817, and which was printed by order of Congress. In this report (see vol. 2, No. 17, of the Reports of the session of the Congress) it is stated that "the Illinois river is about 300 miles in length, and is of variable width, from seventy yards to one mile. It has a very moderate current, and a depth of water sufficient to render it navigable, at all times, for boats of considerable burthen, about 250 miles from its mouth." In speaking of the proposed canal, Major Long observes, "a canal uniting the waters of the Illinois river with those of Lake Michigan, may be considered the first in importance of any in this quarter of the country, and at the same time the construction of it would be attended with very little expense compared with the magnitude of the object. By a reference to the document before referred to, it will also be seen that another report was made on the same subject by Richard Graham, Esq. and the late Chief Justice Phillips, of the state of Illinois. Without quoting particularly from their intelligent report, it will be sufficient to observe that they coincide substantially with Major Long. They present, however, the further fact, that it is perfectly practicable so to employ the water of the lake, as to furnish a full supply of water for the canal.

The committee do not deem it necessary to refer to other authorities or facts to establish the question of practicability; numerous as they are, they deem these sufficient.

In considering, secondly, the "importance of

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this communication," the committee have deemed it proper to present, somewhat in detail, the considerations which render it so. In doing this, it is thought not unworthy of remark, that Mr. Calhoun, the Secretary of War, as far back as 1819, recommended, in a report to Congress, the attention of the government to this point as being important in a military point of view (see vol. 4, Pub. Doc. 2d ses. 15th Congress.) The readiness with which men and arms could be brought to bear on the savages of that quarter, by means of this canal from the states of Illinois and Missouri, as well the British, or any other enemy, on the lakes and its borders, would seem at once to prove the correctness of the views of the Secretary of War in making this recommendation; and the committee will, therefore, proceed to examine the subject with reference to its commercial importance.

The memorial of the General Assembly of Illinois, represents that, during a great part of each year, the inclemency of the climate of New-Orleans, (at present the great outlet of the western country), is such, as to endanger, not only the soundness of the property, but the lives of those who venture thither with it in pursuit of a market; and suggests that these evils would be remedied by throwing open to them, through this communication, the markets of the north. When it is considered that the great line of canal from New-York to Buffalo, will very soon be completed, the views of the Legislature, it is believed, must be admitted to be correct. Between the proposed communication in Illinois and Buffalo, steam boats of four hundred and fifty tons burthen, have already passed with a cargo of that amount. The whole of the intervening navigation, indeed, is on the lakes, except the passage through the strait between lakes Michigan and Huron, of ten miles; the strait between Huron and St. Clair, of thirty-five miles, and the strait between St. Clair and Erie of twenty-eight miles, making, in the whole, seventy-three miles. Through each of these straits, however, there is sufficient depth of water for sloops and steam boats of the description just mentioned.

Its effects on the cost of transportation from the Atlantic cities to a large portion of the western country, the committee conceive to be worthy of consideration. At present, (and it is believed it will always be the case, as well from natural, as artificial causes,) the consumption of manufactured articles, whether of foreign or domestic production, in the west, must be mainly supplied from the eastern and northern states and cities. With a navigation now open, during the major part of each year, from that country to New-Orleans; it is a fact not to be denied, that most of those supplies are now brought from the northern and eastern Atlantic cities. As the population of the west increases, this consumption will increase; and whatever plan can be adopted to lessen the expense, and facilitate the transportation of those supplies, to any considerable portion of that country, seems to be worthy of the patronage of Congress.

At present the cost of transporting a ton of merchandise from New-York, Philadelphia, or Baltimore, to St. Louis, may be estimated at about \$90. This is as low an average as the experience of the last three or four years will warrant the committee in assuming; and the time necessary for this transportation may be estimated at from 20 to 22 days, and the distance from Philadelphia, the intermediate point, is about 1500 miles. The cost of transporting a ton of the same commodities from New-York to St. Louis, through the lakes, according to estimates founded on the probable expense, as calculated in New-York, of a passage through her canal, and the experience of those engaged in the lake navigation, would be from \$63 to \$65; the distance being about the same as on the route before referred to, and the time necessary for the voyage

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being from fore, in the in favour of saving of 8 days. T felt as well importance view of, extensive summer a ruption of the same whole of the of the west in about the are required than the ex avoided by consequen ties which hand before

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Nor is the free outlet Lakes and pens to the South Ame markets—s

being from 12 to 15 days. Making a saving, therefore, in the cost of the transportation of a single ton in favour of the lake route, of from 25 to 27, and a saving of time in performing the trip of from 6 to 8 days. This saving, it must be obvious, would be felt as well by the consumer as the trader. But its importance is not to be confined alone to that view of the subject. At present, owing to the effect of the southern climate, which prevents the extensive use of the lower Mississippi, during the summer and fall months, and to the interruption of the navigation of the Ohio, during the same period, the whole, or very nearly the whole of the supplies imported into a large portion of the western country, for each year, are brought in about the same time; and, thus, larger supplies are required to be kept on hand for a longer period than the existing demand requires. This would be avoided by opening a northern communication, and, consequently, reduce the price of those commodities which are now required to be kept so long on hand before their sale is effected.

While all these advantages would result from this facility to the importation of articles into that section of the country, advantages no less important would result from it, as a facility to their export trade. From the rich lands of Illinois and Missouri, adapted as they are to the production of hemp, flax, flour, beef, pork, hides, whiskey, tobacco, and wool, and abounding, as they do, with lead and iron ore, the enterprising citizens of those states may expect to send out large quantities of those articles; and, for the vast quantities of furs and peltries that are collected at St. Louis, from the extensive regions west of that place, a northern outlet will be no less important. So important has it been conceived to be to the interests of Missouri, as well as to Illinois, that the Legislature of Missouri, at the time of making application for admission into the Union, prayed Congress to set apart a fund to arise from the sales of the public lands within that state, for the execution of this specific object.

In a political point of view, which is the third and last aspect in which the committee propose to present it, its importance will be found not less imposing than in either of those in which it has already been viewed. In uniting and drawing together the interests of the remote extremities of the eastern, the southern, and the western sections of our Union, no work of the same magnitude, it is believed, can be more effectual. The geographical position of Illinois and Missouri, the two states peculiarly interested in it, is such, that they will, under the advantages of this communication, have a common, and almost an equal interest in preserving their connection with the north and the south. Their trade will alternately flow through the lakes and the Mississippi; and the advantages of a choice of markets will be so important to them, that they must ever be unwilling to surrender it.

By a reference to the map of our country, it will be seen that these states will have it in their power, at all times, in the event, should it unfortunately ever occur, of any internal commotions, to command the waters of the Ohio and Mississippi. From their commanding position, therefore, as well as from their capacity to sustain a dense, and it must mainly be a free population, they will always hold the balance of power, in deciding every effort that may be made to separate the West from either, or both, of the great geographical divisions of the Union; and, if from no other cause, their interest will direct the exertion of that power in favour of the Union.

Nor is the interest of these states in preserving a free outlet for their commerce both through the lakes and the Mississippi—the latter of which opens to them the New-Orleans, the West India, and South American markets, and, in fact, all foreign markets—stronger than must be that of the north

and south, in being united with them. Their capacity to supply the single article of lead, so indispensable in military operations in time of war, will, of itself, be sufficient to render them important to either division of the Union. But their capacity to cripple the operations of both sections, by their command over the supplies of the south-west, and their ready means of co-operation with the enemies of the north, on the Lakes, constitutes a corresponding interest no less strong on their part, to remain in alliance with them.

And these two States, embracing as they do upwards of 100,000 square miles of territory, cannot fail, in process of time to be equal in point of physical power to the preservation of their geographical importance in relation to the Union. But the political effects of this communication do not end here. By opening it, when taken in connection with others that must and will be opened in Ohio and Indiana, the rapid settlement of our most vulnerable frontier, that bordering on Canada, would be induced. The numerous hordes of savages in that quarter, from whom we suffered so much during the late war, would be held in check, and the necessary increase of our civil marine on the Lakes, would constitute a strong safeguard against the depredations of both them and the British, in the event of a future war. It would, also, by that increase of commerce which it would produce on the Lakes, afford an additional nursery for our seamen; an effect, to which this, as a commercial nation, ought not to be indifferent.

As to the expense of this work, the committee have no certain data from which to deduce any very accurate conclusion. Taking Major Long's report to be substantially correct, the length of the canal will not exceed seventy miles. The presumption is, it will be less. But assuming that as the whole length, considering the almost entirely level face of the country through which it will pass, it cannot cost more than \$500,000. For the purpose of raising this sum, the committee are of opinion that no appropriation of money out of the Treasury is necessary. If, as the committee beg leave to recommend, a strip of land, of the width of two miles on each side of the canal shall be granted to the Legislature of Illinois, it is believed the State would be able to raise a sum sufficient to complete the work. The quantity of land thus proposed to be granted would amount to seven townships and three-quarters of a township, which, if sold at the minimum price of the public lands, would yield only the sum of \$224,000. But, owing to the additional value that this work would impart to it, the committee believe the State would, under a prudent management, be able to raise double that sum. In recommending this measure, the committee feel satisfied that, eventually, the Treasury would sustain no diminution of its revenue. The increased value not only of the immediately adjacent public lands, but of those throughout the major part of the lands both in Illinois and Missouri, would not only reimburse the Treasury, but would much more than do it.

In Illinois and Missouri there remains to be sold not less than 70,000,000 acres of public land. The nation as yet, therefore, is the great proprietor in both of those States; and while it will, by adopting the measure proposed, be advancing the local interests of the people of those States, as well as the general interests of the people of a large division of the Union, it will, in a still greater degree, be advancing its own.

The lands through which the whole of this canal will pass, are already surveyed and prepared for market. The location of the canal is, also, no doubt, already made, and the means thus proposed to be put into the hands of the State, could, therefore, be immediately employed; and the committee therefore, report a bill, making the grant suggested.

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MEMORIAL

Of the General Assembly of Illinois,

Praying a modification of the laws relating to the sale of Public Land, so as to authorize the sale of certain Lands at fifty cents per acre.

To the hon. Senate and House of Representatives of the United States of America, in Congress assembled,

The memorial of the people of the state of Illinois, represented in the General Assembly,

Respectfully shews:

That your memorialists, believing that the existing laws relating to public lands, are unequal in their operation and injurious in their tendency, both to the national interest and to the welfare of large portions of the western country, beg leave to submit the following observations: The present price of public lands, so far as it relates to those districts of country which have been recently offered for sale, affords no grounds of complaint; but your memorialists believe that a distinction ought to be made between land thus situated, and such as has been longer in market. In the latter case, the most choice selections having been made by the bidders at public sale, by non-residents who have purchased on speculation, or by early settlers, the land remaining is either of inferior quality, or subject to some local disadvantages, and it would seem reasonable that its price should be reduced in proportion to its actual value. The value of such land will naturally be ascertained by comparing its quality with that of adjacent tracts, and the purchaser would reluctantly pay for it the same price which has been given for superior soil and better situations. The natural consequence of such a state of things is, that the emigrant is driven to new and distant settlements where few have preceded him, and where the inconvenience of which we complain does not operate upon his choice; the tide of population is thus diverted into a thousand channels, and suffered to roll over immense regions, creating feeble and thinly scattered settlements, and leaving extensive tracts of wilderness behind. Under a government like ours, cemented only by the mutual affection of the people, it is to be doubted whether a policy should be pursued, which, by diffusing the population, weakens the political strength of national and state confederacies, and loosens the ties which should bind the people together. In a scattered population, public institutions are seldom established; systems of education cannot be matured; moral restraints are tardily enforced; laws are feebly executed, and revenue raised with difficulty.

To concentrate the daily accumulating population of the western states, would not only add to the character of the American people, by promoting the progress of civilization in a large section of the Union, but would give strength and stability to the newly created states. To the state governments in the west, the contemplated change is particularly desirable, on account of the important addition which it would afford to their revenues. Possessing a country of great extent and fertility, we want only the means of improvement to bring its great natural resources into useful operation. The increase of physical strength which would be derived by alluring the emigrant to the settlements already made, and thus filling up the country, and producing a denser population than now exists, would be one step towards this important object, and the consequent improvement of revenue which is anticipated, would be another. Should these hopes be realized, it is believed that the great work of internal improvement, which now appears to engage the attention of a large portion of the American people, might be commenced among us; new sources of wealth would be opened, and that friendly intercourse which should subsist among the members of the great political family, would be facilitated to the benefit and convenience of all. We might also

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Look forward to the day when the liberal and useful arts might be cherished by the fostering hand of governments; and when the new states might prove as fertile in mental, as they now are in natural productions. The pecuniary embarrassments under which the western people have long laboured, and which still press them with a heavy hand, are too well known, and have been too often urged upon the consideration of Congress, to need further illustrations. This cause alone, if no other existed, would be sufficient to retard the sale of public lands; but its operation is greater, in respect to the lands in question, in proportion to the allurements held out to purchasers in the newly formed districts. How far this fact will be considered as affording us additional claims upon the justice and liberality of Congress, is not for us to determine.

For all these reasons, your memorialists respectfully pray that the present laws relating to the sale of public lands, be so modified as to authorize the sale of all such lands as have been offered for sale five years or more, for fifty cents per acre.

And your memorialists, as in duty bound, will ever pray.

Appointments

Appointments by the President, by and with the advice and consent of the Senate.

JOSEPH HILL CLARK, of Massachusetts, to be Consul of the United States for the port of Lubec.

DANIEL W. SMITH, to be Consul of the United States at Refugio, Mexico, Rio Grande.

The following passed Midshipmen, have been recently promoted to the rank of Lieutenant in the Navy of the United States, and rank in the order in which they are now arranged.

NAVY DEPARTMENT, Feb. 14, 1825.

Daniel H. Mackey
Edward W. Carpenter
John L. Saunders
Joseph B. Hull
Jott S. Paine
John E. Prentiss
Joseph Moorehead
Samuel B. Phelps
William T. Rodgers
Thomas Petigru
Augustus Cutts
John S. Chauncey
Irvine Shubrick
Charles Ellery
Thomas R. Gerry
John Kelly
Hugh Dulany
Edmund Byrne
Edward S. Johnson
William H. Gardner
Frederick Jarrett
David G. Farragut
Richard S. Pinckney
Stephen B. Wilson
Edward C. Rutledge
William S. Harris
Thomas Dornin
Benjamin S. Grimke
John P. Tuttle
Robert B. Cunningham
James Glynn
Joseph Myers
William C. Wetmore
William B. Nicholson
Thomas R. Gedney
John Bubier
Victor M. Randolph

Joseph Cutts
Jacob Crowninshield
Frederick Engle
Thomas S. Browne
Alexander J. D. Browne
Jesse Smith
John H. Smith
Meritt S. Scott (since dead)
Francis Sanderson
John Rudd
Robert Ritchie
David R. Stewart
William W. McKean
Benjamin Tallmadge, Jr.
Franklin Buchanan
Hubbard H. Hobbs
Samuel Mercer
Charles Lowndes
Lomis M. Goldsborough
Duncan N. Ingraham
John Marston, Jr.
Henry Bruce
William D. Newman
Henry A. Adams
Alexander B. Pinkham
William A. Homer
James D. Knight
Joseph Mattison
William S. Walker
Alexander Slidell
James G. Boughan
George F. Pearson

Laws of the United States.

AN ACT concerning General La Fayette.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That, in consideration of the services and sacrifices of General La Fayette, in the war of the Revolution, the Secretary of the Treasury be, and he is hereby, authorized to pay to him the sum of two hundred thousand dollars, out of any money in the Treasury not otherwise appropriated.

SEC. 2. *And be it further enacted,* That there be granted to the said General La Fayette, and his heirs, one township of land, to be laid out and located under the authority of the President, in any of the unappropriated lands of the United States.

H. CLAY,

Speaker of the House of Representatives.

JOHN GAILLARD,

Pres't of the Senate, pro tempore.

Washington, Dec. 23th, 1824.—Approved:

JAMES MONROE.

AN ACT to authorize the Legislature of the State of Ohio to sell and convey certain tracts of land, granted to said State for the use of the people thereof.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Legislature of the State of Ohio shall be, and is hereby authorized and empowered to cause to be sold and conveyed, in such manner, and on such terms and conditions, as said legislature shall, by law, direct, the following tracts of land, heretofore granted to said State, for the use of the people thereof, to wit: So much of the Six Mile Reservation, including the Salt Springs; commonly called the Scioto Salt Springs, as remains unsold, the Salt Springs near the Muskingum River, and in the military tract, with the sections of land which include the same; the proceeds thereof to be applied to such literary purposes as said Legislature may, hereafter, direct, and to no other use, intent, or purpose whatsoever.

H. CLAY,

Speaker of the House of Representatives.

JOHN GAILLARD,

Pres't of the Senate, pro tempore.

Washington, Dec. 23th, 1824.—Approved:

JAMES MONROE.

AN ACT authorizing repayment for land erroneously sold by the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That every person, or the legal representative of every person,

who is, or may be, a purchaser of a tract of land from the United States, the purchase whereof is, or may be void, by reason of a prior sale thereof by the United States, or by the confirmation, or other legal establishment of a prior British, French, or Spanish grant thereof, or for want of title thereto in the United States, or from any other cause whatsoever, shall be entitled to repayment of any sum or sums of money paid for, or on account of such tract of land, on making proof, to the satisfaction of the Secretary of the Treasury, that the same was erroneously sold, in manner aforesaid, by the United States, who is hereby authorized and required to pay such sum or sums of money, paid as aforesaid.

Washington, Jan. 12th, 1825.—Approved.

JAMES MONROE.

AN ACT, in addition to an Act, entitled, "An Act to amend the Ordinance and Acts of Congress for the government of the Territory of Michigan, and for other purposes."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Governor and Legislative Council of the Territory of Michigan, be, and they are hereby, authorized to divide said Territory into townships, and incorporate the same, or any part thereof, to grant, define, and regulate the privileges thereof; and to provide by law for the election of all such township and Corporation officers, as may be designated within the same.

SEC. 2. *And be it further enacted,* That all county officers within said Territory shall be hereafter elected by the qualified electors residing in each county, at such time and place, and in such manner, as the said Governor and Legislative Council may from time to time direct: *Provided,* That nothing in this section contained shall authorize the electors aforesaid, to elect any Judge of any Court of Record, or Clerk thereof, or any Sheriff, or Judge of Probate, or Justice of the Peace. And that so much of the ordinance of Congress, passed July thirteen, seventeen hundred and eighty-seven, and of the laws of the United States, as are inconsistent with the provisions of this section, and as regard the Michigan Territory, be, and the same are hereby, repealed.

SEC. 3. *And be it further enacted,* That the Governor of the said Territory shall nominate, and, by and with the advice and consent of the said Legislative Council, shall appoint all other civil officers in said Territory, except such as are appointed by the President of the United States, by and with the advice and consent of the Senate of the same. And the Governor of said Territory shall have power to fill all vacancies in the offices required to be nominated by him, which may happen during the recess of the said Legislative Council, by granting commissions which shall expire at the end of their next session.

SEC. 4. *And be it further enacted,* That the qualified electors of said Territory shall, at their next, and every subsequent election for members of their Legislative Council, choose, by ballot, eight persons, having the qualifications of electors, in addition to the number now by law authorized; and the names of the twenty-six persons so elected, shall be transmitted by the Governor of said Territory, to the President of the United States, immediately after said election, who shall nominate, and, by and with the advice and consent of the Senate of the United States, appoint, therefrom, thirteen persons; which said thirteen persons shall compose the Legislative Council, any nine of whom shall form a quorum to transact business; and all vacancies occurring in said Council, shall be filled in the same manner, from the list transmitted as aforesaid. The members of the said Legislative Council shall receive three dollars each per day, during their attendance at the sessions thereof, and three dollars for every twenty miles in going to and returning therefrom, in full compensation for their services; which shall be paid by the United States.

SEC. 5. *And be it further enacted,* That appeals and writs of error shall lie, from the decision of the highest Judicial Tribunal of said Territory to the Supreme Court of the United States, in the same manner, and under the same regulations, as do lie and are taken from the Circuit Courts of the United States, where the amount in controversy shall exceed one thousand dollars, which shall be ascertained by evidence satisfactory to the Court allowing the appeal.

SEC. 6. *And be it further enacted,* That not less than two Judges of the Supreme or Superior Court of said Territory, shall hereafter hold a Court to transact the business of said Court.

SEC. 7. *And be it further enacted,* That so much of any ordinance or law of the United States as contravenes the provisions of this act, so far as respects the Territory of Michigan, be, and the same is hereby, repealed.

Approved Feb. 5th, 1825.

JAMES MONROE.

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